User Manual

Revision 2.012
English

M-Bus / RS232 - Converter

(Order Codes: HD67021M-20, HD67021M-40, HD67021M-80, HD67021M-160, HD67021M-250)

M-Bus / RS485 - Converter

(Order Codes: HD67022M-20, HD67022M-40, HD67022M-80, HD67022M-160, HD67022M-250)

for Website information:
www.adfweb.com?Product=HD67021
www.adfweb.com?Product=HD67022

for Price information:
www.adfweb.com?Price=HD67021M-20
www.adfweb.com?Price=HD67021M-40
www.adfweb.com?Price=HD67021M-80
www.adfweb.com?Price=HD67021M-160
www.adfweb.com?Price=HD67021M-250
www.adfweb.com?Price=HD67022M-20
www.adfweb.com?Price=HD67022M-40
www.adfweb.com?Price=HD67022M-80
www.adfweb.com?Price=HD67022M-160
www.adfweb.com?Price=HD67022M-250

Benefits and Main Features:

- Very easy to configure
- Microprocessor for queue data control
- Electrical isolation between RS232/RS485 and M-Bus
- Industrial temperature range: -40°C / 70°C (-40°F / 158°F)

HD67021M-20

HD67021M-xxx

HD67022M-20

HD67022M-xxx

Similiar Products

For other M-Bus products see also the following link:

Gateway M-Bus / Modbus RTU
www.adfweb.com?Product=HD67029M-232 **(on RS232)**
www.adfweb.com?Product=HD67029M-485 **(on RS485)**

Converter M-Bus to
www.adfweb.com?Product=HD67030 **(Ethernet)**

Analyzer & Scanner M-Bus
www.adfweb.com?Product=HD67031

Extender and Repeater, M-Bus
www.adfweb.com?Product=HD67032

Gateway M-Bus / Modbus TCP
www.adfweb.com?Product=HD67044M

Gateway M-Bus Concentrator
www.adfweb.com?Product=HD67054M

Gateway M-Bus / PROFIBUS
www.adfweb.com?Product=HD67053M

Gateway M-Bus Slave / Modbus RTU master
www.adfweb.com?Product=HD67059M-232

Do you need to choose a device? do you want help?
Ask it to the following link: www.adfweb.com?Cmd=helpme

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UPDATED DOCUMENTATION:

Dear customer, we thank you for your attention and we remind you that you need to check that the following document is:

- Updated
- Related to the product you own

To obtain the most recently updated document, note the "document code" that appears at the top right-hand corner of each page of this document.

With this "Document Code" go to web page www.adfweb.com/download/ and search for the corresponding code on the page. Click on the proper "Document Code" and download the updates.

To obtain the updated documentation for the product that you own, note the "Document Code" (Abbreviated written "Doc. Code" on the label on the product) and download the updated from our web site www.adfweb.com/download/

REVISION LIST:

Revision	Date	Author	Chapter	Description
2.000	25/06/2010	Fl	All	New document format
2.001	21/10/2010	Fl	All	Revision
2.002	17/01/2010	Fl	All	Revision
2.010	09/11/2011	Fl	All	Software changed (v1.200)
2.011	16/07/2012	Fl	All	Software link changed
2.012	04/04/2013	Nt	All	Added new chapters

WARNING:

ADFweb.com reserves the right to change information in this manual about our product without warning.
ADFweb.com is not responsible for any error this manual may contain.

TRADEMARKS:

All trademarks mentioned in this document belong to their respective owners.

SECURITY ALERT:

GENERAL INFORMATION

To ensure safe operation, the device must be operated according to the instructions in the manual. When using the device are required for each individual application, legal and safety regulation. The same applies also when using accessories.

INTENDED USE

Machines and systems must be designed so the faulty conditions do not lead to a dangerous situation for the operator (i.e. independent limit switches, mechanical interlocks, etc.).

QUALIFIED PERSONNEL

The device can be used only by qualified personnel, strictly in accordance with the specifications.
Qualified personnel are persons who are familiar with the installation, assembly, commissioning and operation of this equipment and who have appropriate qualifications for their job.

RESIDUAL RISKS

The device is state of the art and is safe. The instrument can represent a potential hazard if they are inappropriately installed and operated by personnel untrained. These instructions refer to residual risks with the following symbol:

This symbol indicates that non-observance of the safety instructions is danger for people to serious injury or death and / or the possibility of damage.

CE CONFORMITY

The declaration is made by us. You can send an email to support@adfweb.com or give us a call if you need it.

CONNECTION SCHEMES:

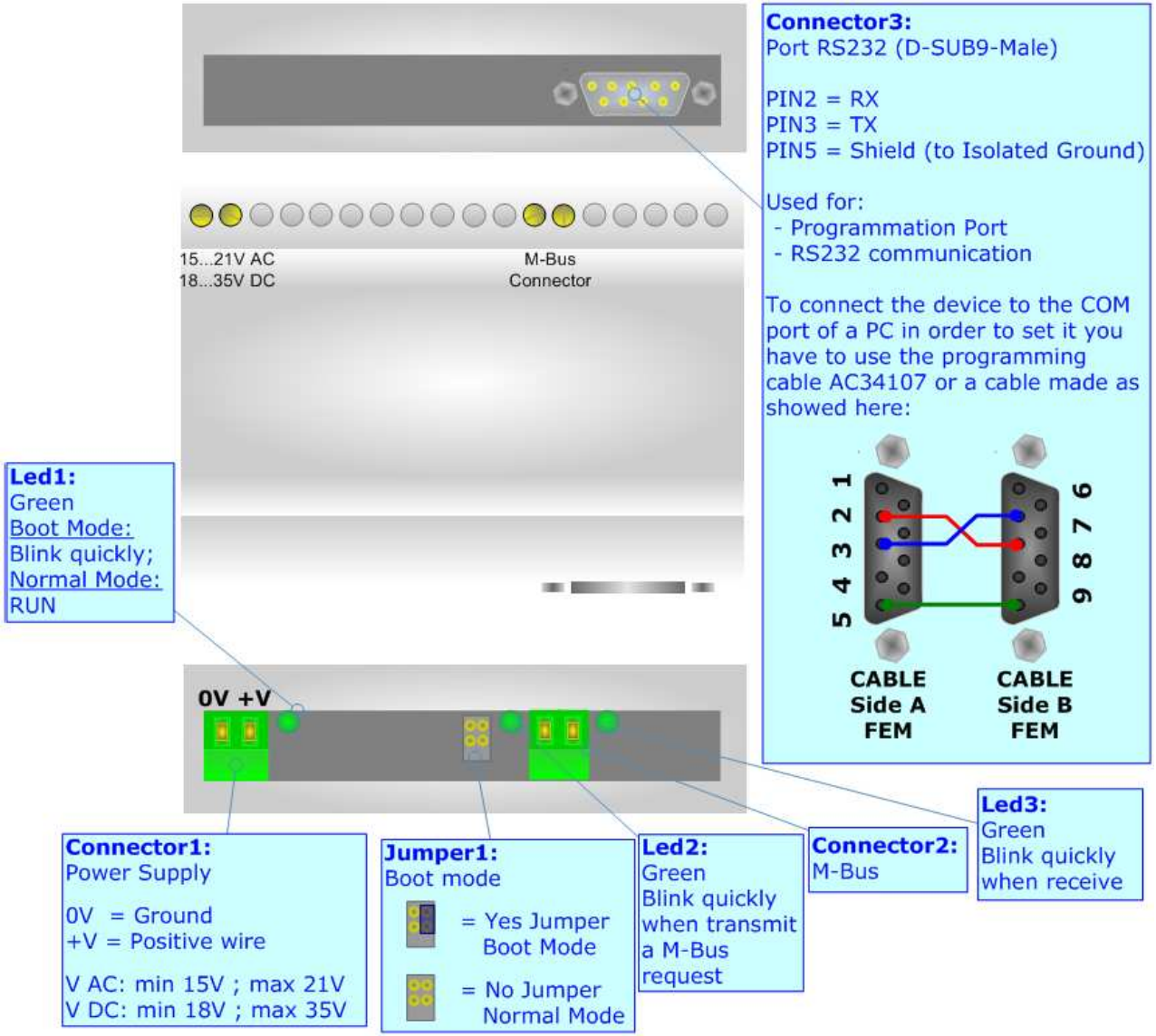


Figure 1: Connection scheme for HD67021M-20

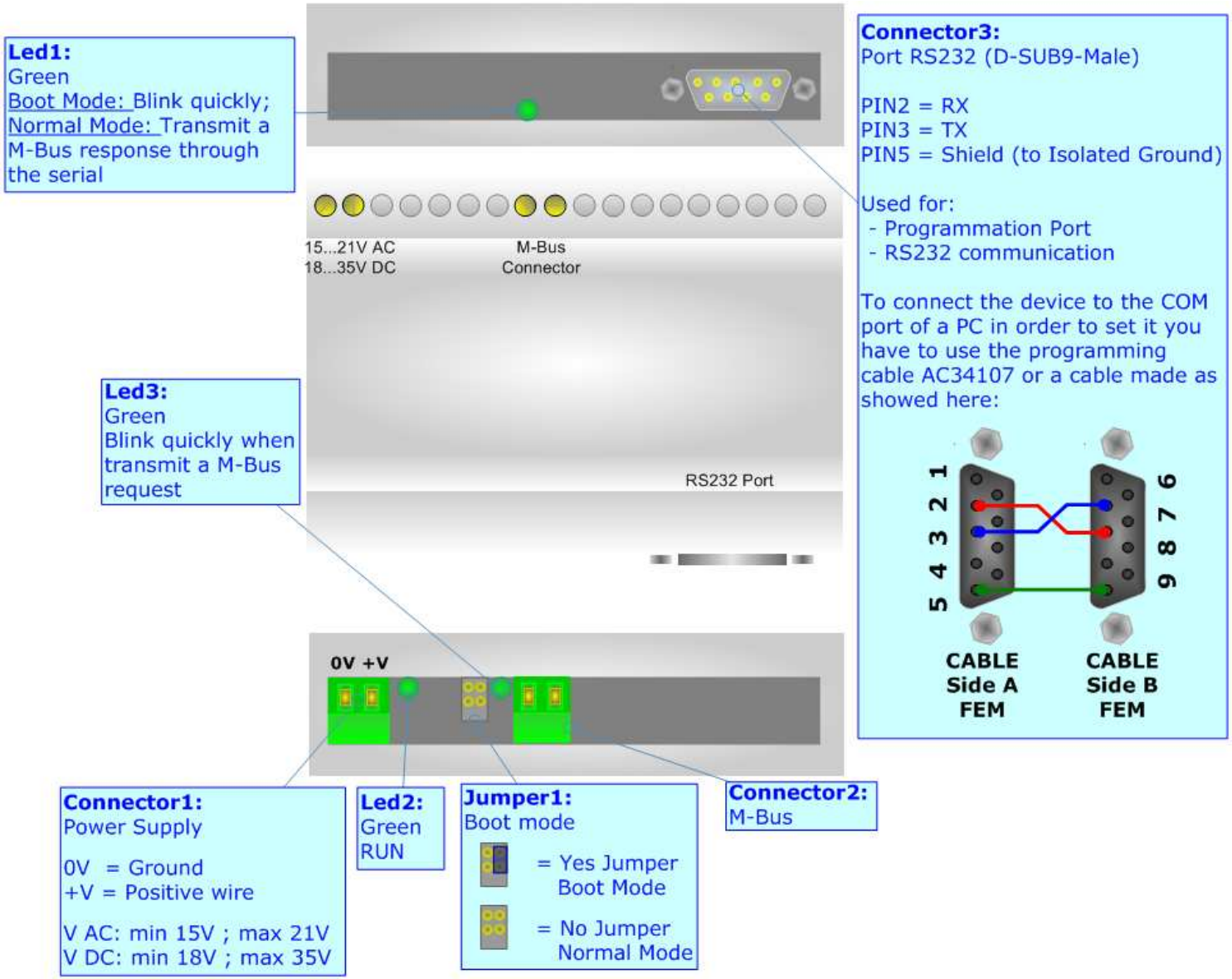


Figure 2: Connection scheme for HD67021M-40, HD67021M-80, HD67021M-160, HD67021M-250

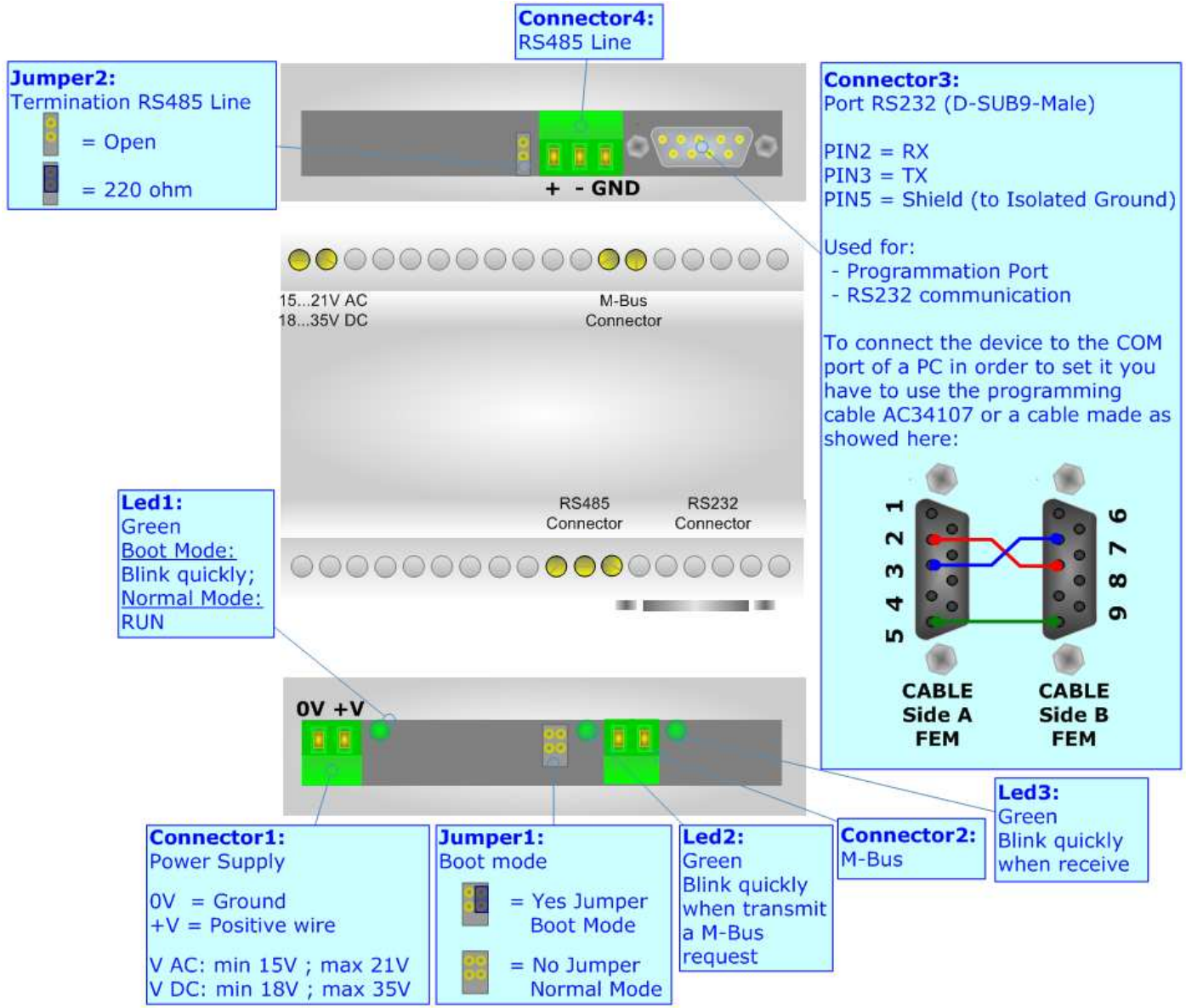


Figure 3: Connection scheme for HD67022M-20

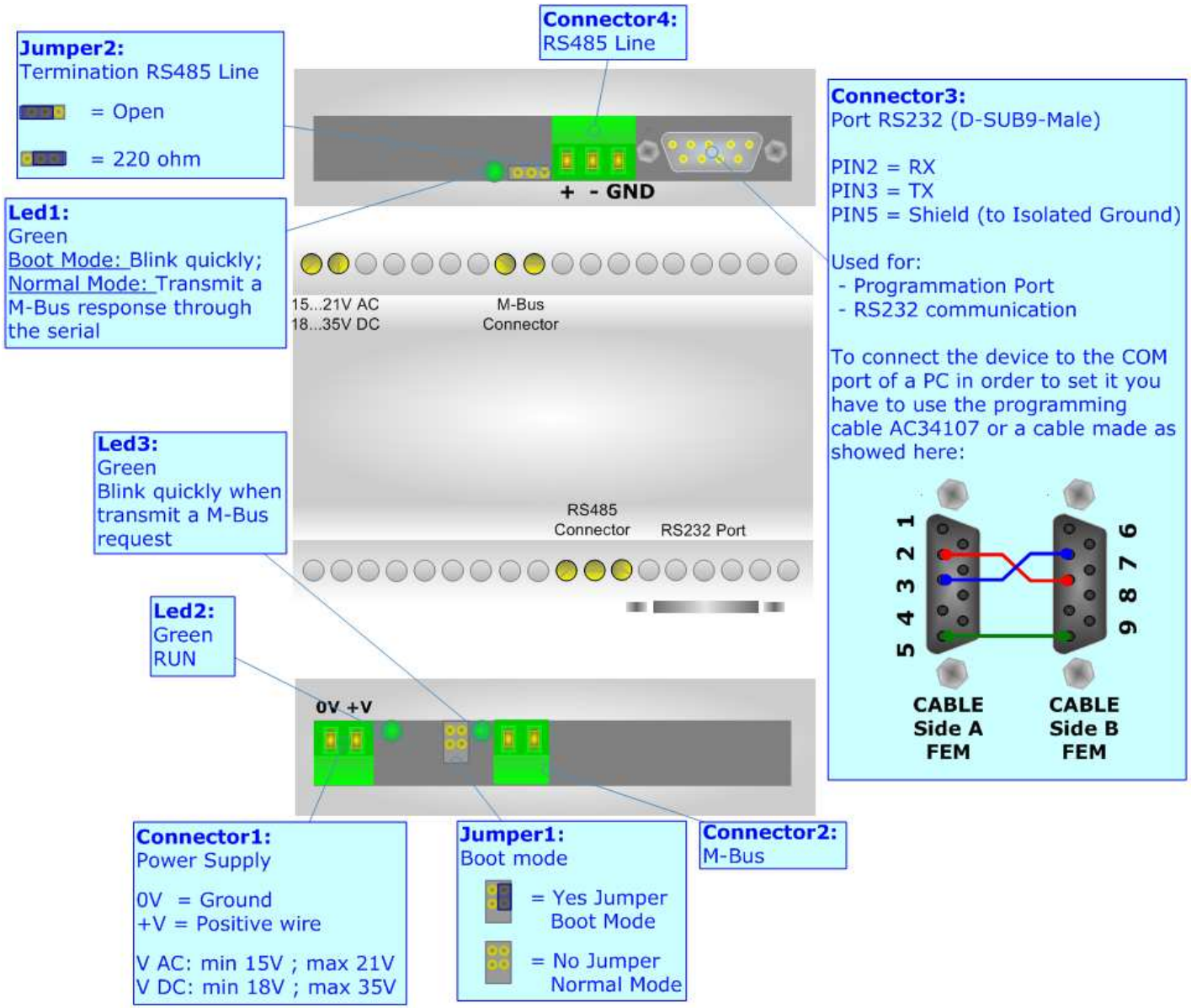


Figure 4: Connection scheme for HD67022M-40, HD67022M-80, HD67022M-160, HD67022M-250

CHARACTERISTICS:

The HD67021M-xxx is a M-Bus / RS232 Converter while the HD67022M-xxx is a M-Bus / RS485 Converter.
The control by microprocessor with 32 bits makes it particularly suitable for supervisor software and the connection to a Personal Computer.

The M-Bus to RS232 or RS485 Converters allows the following characteristics:

- Electrical isolation between RS232/RS485 and M-Bus;
- Baud Rate and Parity changeable with software;
- Mountable on Rail DIN;
- Power Supply 15…21V AC or 18…35V DC;
- Temperature range -40°C to 70°C.

At the Adapters can be connected up to 250 standard M-Bus devices. This number depends of the code expressed by the xxx number:

- HD67021M-20 or HD67022M-20 support up to 20 M-Bus devices;
- HD67021M-40 or HD67022M-40 support up to 40 M-Bus devices;
- HD67021M-80 or HD67022M-80 support up to 80 M-Bus devices;
- HD67021M-160 or HD67022M-160 support up to 160 M-Bus devices;
- HD67021M-250 or HD67022M-250 support up to 250 M-Bus devices.

In the case of HD67021M-160 and or HD67022M-160 the device must be mounted on 35mm DIN rail which is horizontally mounted on a wall or cabinet back-plate. To avoid obstructions to the airflow around the unit it is recommended to not cover the paths of air.

In the case of HD67021M-250 and or HD67022M-250 the device must be mounted on 35mm DIN rail which is horizontally mounted on a wall or cabinet back-plate. These units have a fan in the top of the enclosure. To avoid obstructions to the airflow around the unit it is recommended to not cover the paths of air. Take care to not cover the fan. It is recommended to put the device into a ventilated cabinet.

POWER SUPPLY:

The devices can be powered at 15…21V AC and 18…35V DC. The consumption depends to the code of the device. For more details see the two tables below.

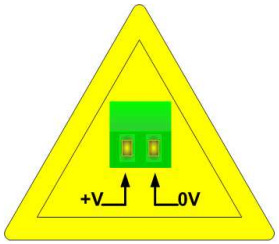
VAC ~		VDC ⎓	
Vmin	**Vmax**	**Vmin**	**Vmax**
15V	**21V**	**18V**	**35V**

Consumption at 24V DC:

Device	No Load [W/VA]	Full Load [W/VA]*
HD67021M-20 / HD67022M-20	3.5	4
HD67021M-40 / HD67022M-40		5
HD67021M-80 / HD67022M-80		8
HD67021M-160 / HD67022M-160		14
HD67021M-250 / HD67022M-250		30

* This value is with all the Slave M-Bus devices of the code (20, 40, 80, 160, 250) connected to the line

Caution: Not reverse the polarity power



HD67021M-xxx HD67022M-xxx

SET COMMUNICATION PARAMETERS:

Configurable Parameters:

- Baud Rate of RS232/RS485 from 300 to 115200 bps and of M-Bus from 300 to 38400 bps;
- Parity of RS232/RS485 and M-Bus with None/Odd/Even.

Fixed Parameters:

- 1 Bit Start;
- 8 Bit Data;
- 1 Bit Stop.

The Baud Rate and the Parity of RS232/RS485 and M-Bus are configurable with the software.

CONFIGURATION:

You need "SW67021 RS232 to Meter-Bus" software on your PC in order to perform the following:

- Define the communication parameters of the RS232/RS485;
- Define the communication parameters of the M-Bus;
- Update the Firmware.

FUNCTION MODES:

For the device HD67021M-xxx and HD67022M-xxx it is possible to update the microprocessor program. Therefore there are two functions to select from the boot jumper:

- NORMAL MODE (factory setting, without BOOT jumper): with this setting the HD67021M-xxx or HD67022M-xxx is able to function as an adapter M-Bus to RS232/RS485;
- BOOT MODE (with BOOT jumper): the boot mode is activated when the HD67021M-xxx or HD67022M-xxx is turned on. Eventual program updates are available on the site www.adfweb.com

When the run LED blinks at frequency of about 1 second, the device functions in Normal Mode, otherwise if the run LED blinks more quickly the device is in Boot Mode.

USE OF SW67021 RS232 TO METER-BUS:

To configure the board, use the available software that runs with Windows, called SW67021. It is downloadable on the site www.adfweb.com and its operation is described in this document.

When launching the SW67021 the right window appears (Fig. 5).

The Window is divided in three sections, one for the INIT COM, another for the DATA SERIALS and the other for the FIRMWARE.

In the field "**Com Port**" must be selected the COM Port of the PC where the serial cable is connected. When the "**Init**" button is pressed, it creates the connection between Personal Computer and HD67021M-xxx/HD67022M-xxx.

The means of the fields for DATA SERIALS are:

- If the field "**Auto Baudrate**" is checked is not necessary to set the two baudrates of the RS232/RS485 and M-Bus. In this case the two Baudrates are the same and the Parity is always Even. If isn't checked, it is possible to define different Baudrates and different Parity.
- In the field "**SERIAL BaudRate**" the baudrate for the RS232/RS485 is defined;
- In the field "**SERIAL Parity**" the parity for the RS232/RS485 is defined;
- In the field "**METER BUS BaudRate**" the baudrate for the M-Bus is defined;
- In the field "**METER BUS Parity**" the parity for the M-Bus is defined.

When the button "**Write Data**" is pressed the parameters are written into the HD67021-xxx/HD67022-xxx microprocessor.
When the button "**Read Data**" is pressed the paramaters in the microprocessor are read and written in the fields under the button.

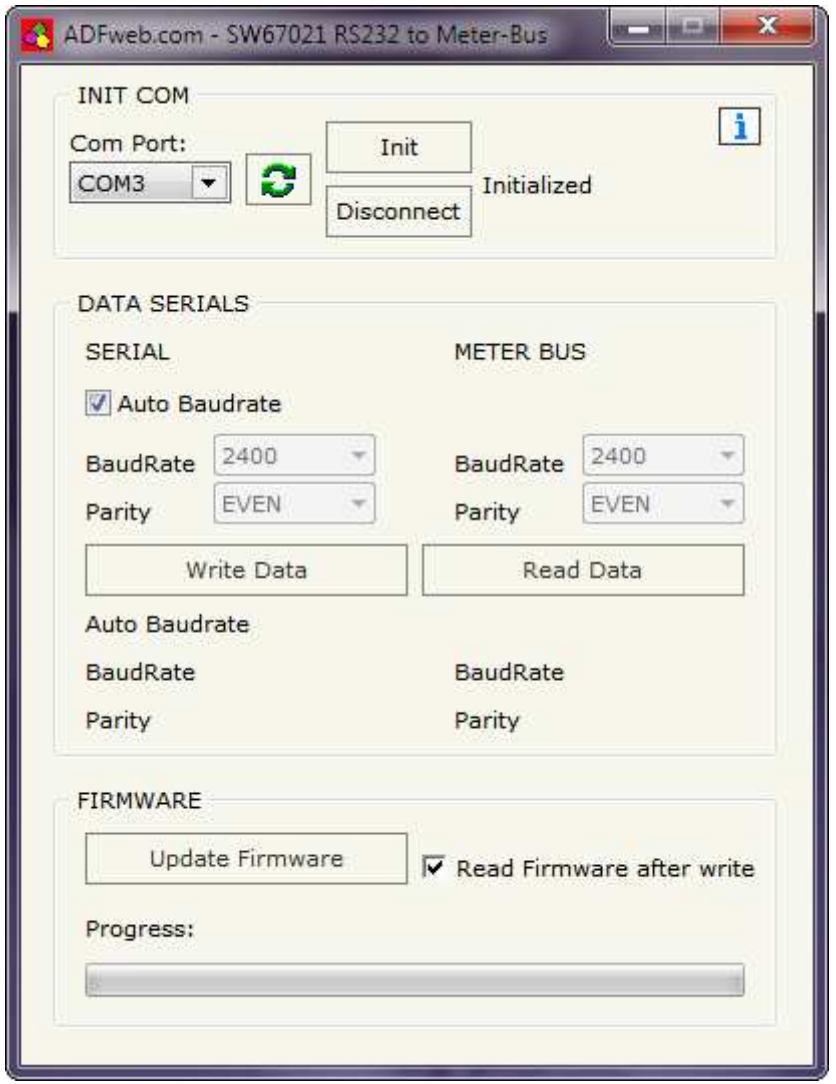


Figure 5: Main window for SW67021

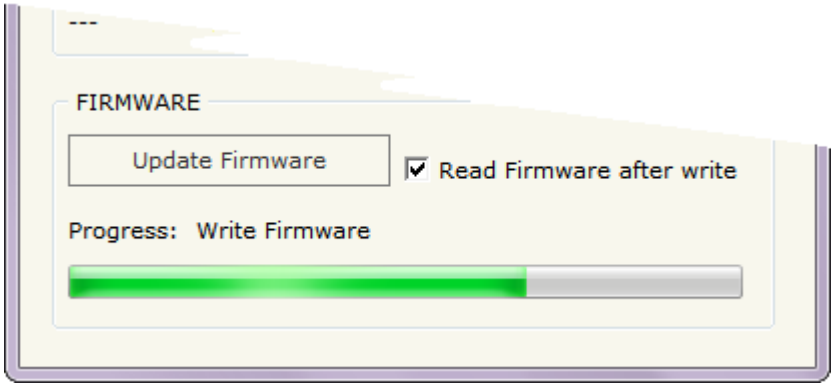
The functions described above shall be made when the device is in Boot. For more details about Boot see "Connection Scheme" (Fig. 1, Fig. 2, Fig. 3, Fig. 4).

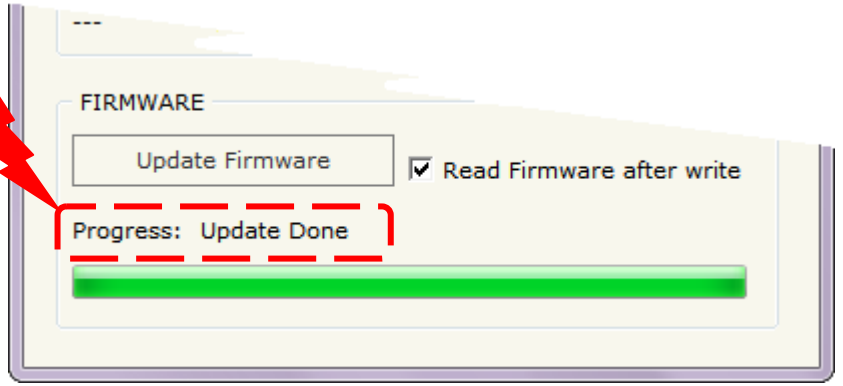
If it is necessary to update the firmware the button "Update Firmware" must be pressed.

In order to update the firmware in the board, or change the Data Serials parameters follow these instructions:

- Turn off the device;
- Insert the Boot Jumper (see the Fig. 1, Fig. 2, Fig. 3, Fig. 4 for more info);
- Turn on the device;
- Press the "**Update Firmware**" button to start the upload;
- When the progress is "Update Done" turn off the device;
- Disconnect the Boot jumper;
- Turn on the Device.

At this point the firmware on the device is correctly update.





Note:
When you install a new version of the software it is better if the first time you do the update of the Firmware in the HD67021M-xxx/HD67022M-xxx device.

Warning:
If you aren't able to complete the Update, before require assistance try these points:

- Check if the serial COM port selected is the correct one;
- Check if the serial is connected between the PC and the device;
- Try to repeat the operations for the updating;
- If you are using a dongle try with a native COM port or change the dongle;
- Try with another PC;
- Try to restart the PC.

In the case of HD67021M-20 you have to use the software "SW67021": www.adfweb.com/download/filefold/SW67021_22.zip.

In the case of HD67021M-40, HD67021M-80, HD67021M-160, HD67021M-250 you have to use the software "SW67021 40 80 160 250": www.adfweb.com/download/filefold/SW67021_40_80_160_250.zip.

In the case of HD67022M-20 you have to use the software "SW67021": www.adfweb.com/download/filefold/SW67021_22.zip.

In the case of HD67022M-40, HD67022M-80, HD67022M-160, HD67022M-250 you have to use the software "SW67021 40 80 160 250": www.adfweb.com/download/filefold/SW67021_40_80_160_250.zip.

CHARACTERISTICS OF THE CABLES:

RS232:

The connection from RS232 socket to a serial port (example one from a personal computer) must be made with a NULL MODEM cable (a serial cable where the pins 2 and 3 are crossed).
It is recommended that the RS232C Cable not exceed 15 meters.

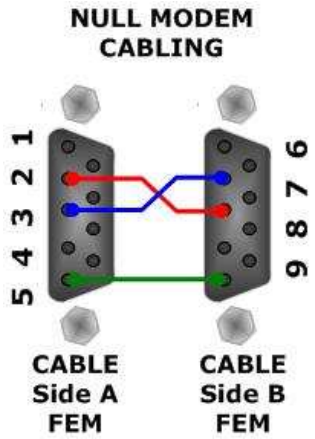


Figure 6: Null modem cabling

M-BUS:

A two wire standard telephone cable (JYStY N*2*0.8 mm) is used as the transmission medium for the M-Bus. The maximum distance between a slave and the repeater is 350m; this length corresponds to a cable resistance of up 29Ω. This distance applies for the standard configuration having Baud rates between 300 and 9600 Baud, and a maximum of 250 slaves. The maximum distance can be increased by limiting the Baud rate and using fewer slaves, but the bus voltage in the space state must at no point in a segment fall below 12V, because of the remote powering of the slaves. In the standard configuration the total cable length should not exceed 1000m, in order to meet the requirement of a maximum cable capacitance of 180nF. *(Taken from M-Bus specifics)*

MECHANICAL DIMENSIONS:

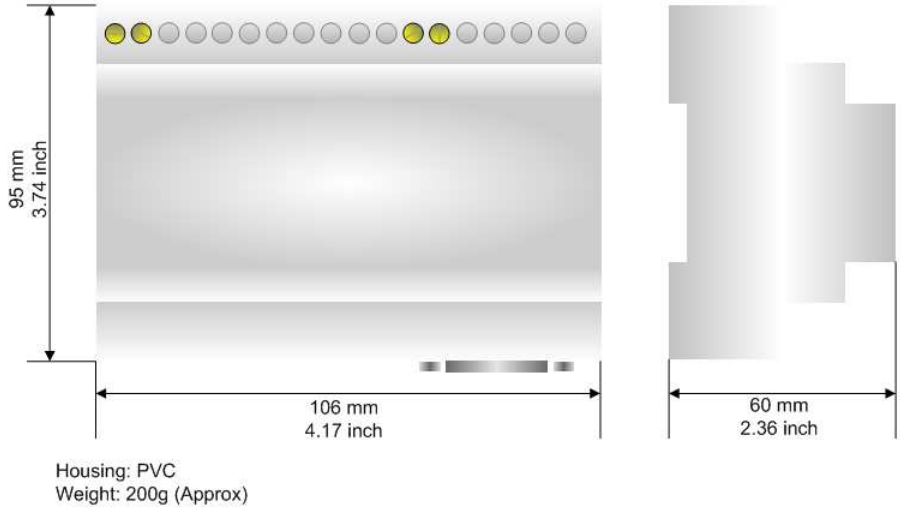


Figure 7: Mechanical dimensions scheme for HD67021M-20

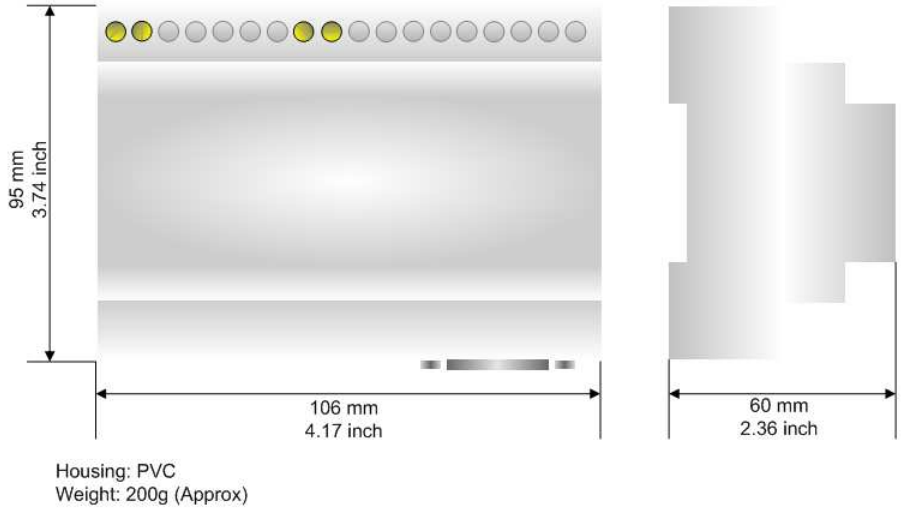


Figure 8: Mechanical dimensions scheme for HD67021M-40, HD67021M-80

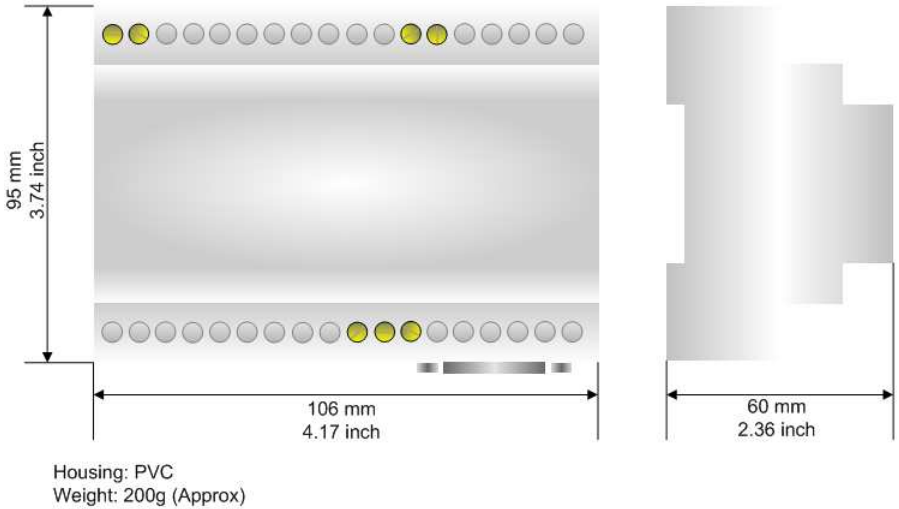


Figure 9: Mechanical dimensions scheme for HD67022M-20

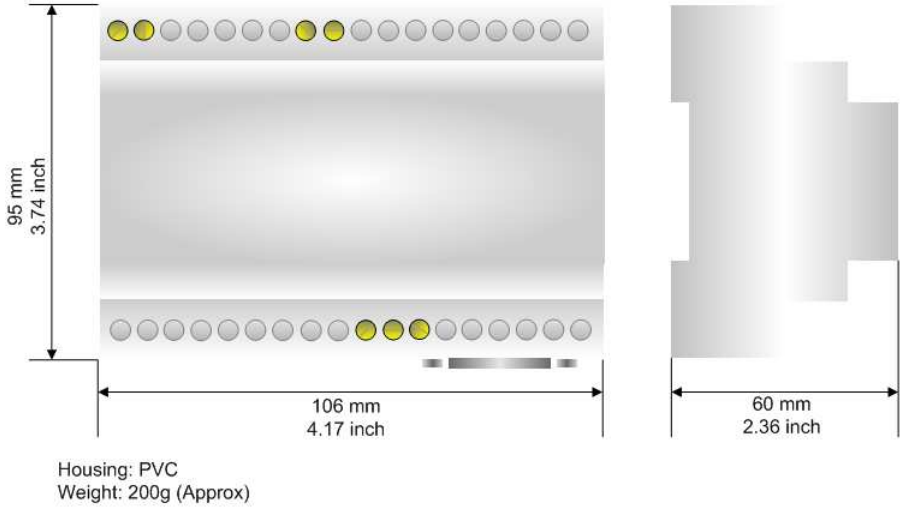


Figure 10: Mechanical dimensions scheme for HD67022M-40, HD67022M-80

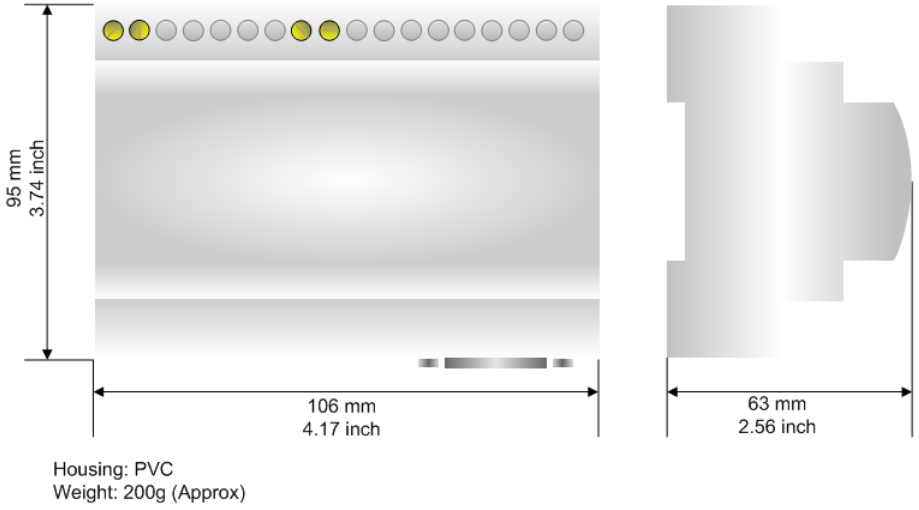


Figure 11: Mechanical dimensions scheme for HD67021M-160

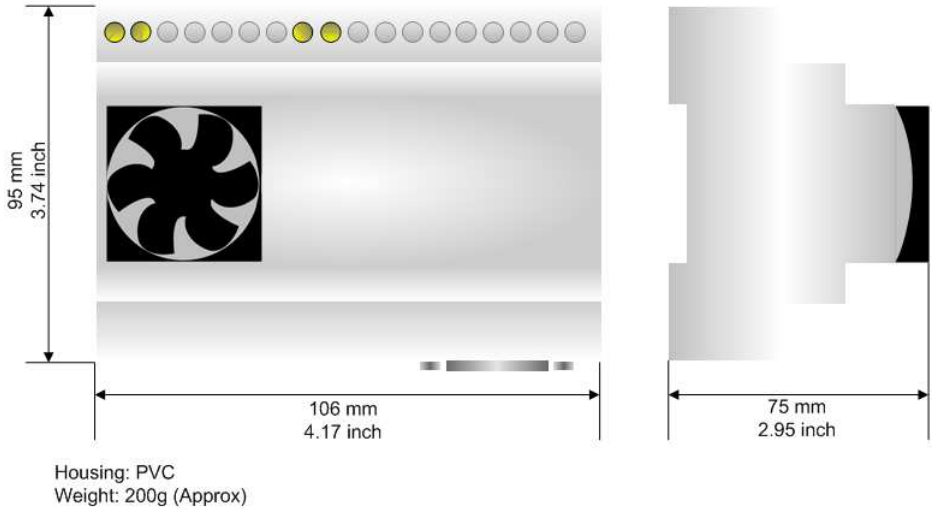


Figure 12: Mechanical dimensions scheme for HD67021M-250

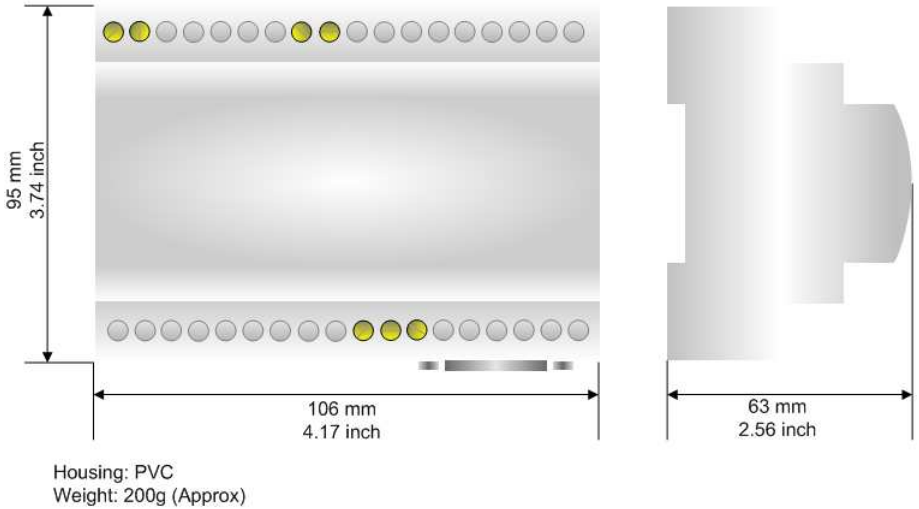


Figure 13: Mechanical dimensions scheme for HD67022M-160

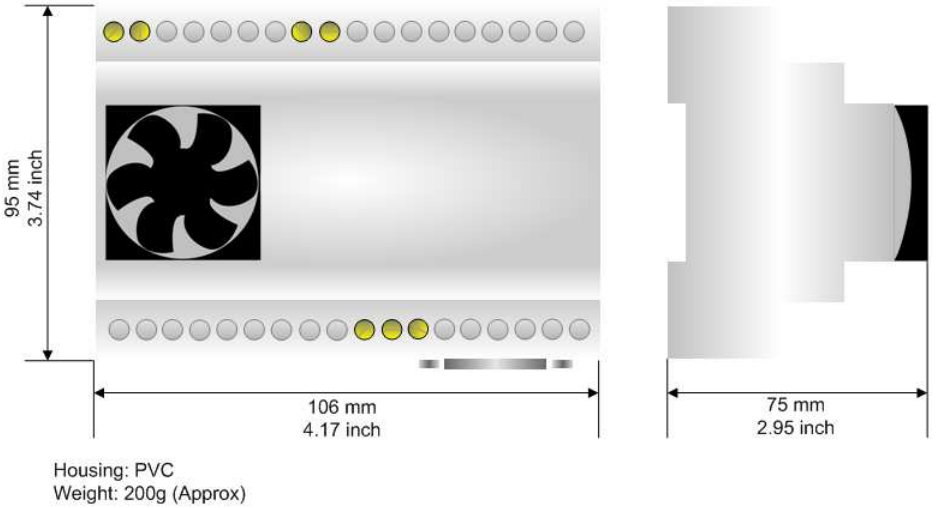


Figure 14: Mechanical dimensions scheme for HD67022M-250

ORDER CODES:

Order Code:	**HD67021M-20**	**-**	M-Bus / RS232 - Converter (up to 20 slaves connected to M-Bus)
Order Code:	**HD67021M-40**	**-**	M-Bus / RS232 - Converter (up to 40 slaves connected to M-Bus)
Order Code:	**HD67021M-80**	**-**	M-Bus / RS232 - Converter (up to 80 slaves connected to M-Bus)
Order Code:	**HD67021M-160**	**-**	M-Bus / RS232 - Converter (up to 160 slaves connected to M-Bus)
Order Code:	**HD67021M-250**	**-**	M-Bus / RS232 - Converter (up to 250 slaves connected to M-Bus)
Order Code:	**HD67022M-20**	**-**	M-Bus / RS485 - Converter (up to 20 slaves connected to M-Bus)
Order Code:	**HD67022M-40**	**-**	M-Bus / RS485 - Converter (up to 40 slaves connected to M-Bus)
Order Code:	**HD67022M-80**	**-**	M-Bus / RS485 - Converter (up to 80 slaves connected to M-Bus)
Order Code:	**HD67022M-160**	**-**	M-Bus / RS485 - Converter (up to 160 slaves connected to M-Bus)
Order Code:	**HD67022M-250**	**-**	M-Bus / RS485 - Converter (up to 250 slaves connected to M-Bus)

ACCESSORIES:

Order Code:	**APW020**	-	Power Supply for M-Bus Master device that supports up to 20 Slaves
Order Code:	**APW040**	-	Power Supply for M-Bus Master device that supports up to 40 Slaves
Order Code:	**APW080**	-	Power Supply for M-Bus Master device that supports up to 80 Slaves
Order Code:	**APW160**	-	Power Supply for M-Bus Master device that supports up to 160 Slaves
Order Code:	**APW250**	-	Power Supply for M-Bus Master device that supports up to 250 Slaves
Order Code:	**AC34107**	**-**	Null Modem Cable Fem/Fem DSub 9 Pin 1,5 m
Order Code:	**AC34114**	-	Null Modem Cable Fem/Fem DSub 9 Pin 5 m

DISCLAIMER

All technical content within this document can be modified without notice. The content of the document content is a recurring audit.
For losses due to fire, earthquake, third party access or other accidents, or intentional or accidental abuse, misuse, or use under abnormal conditions repairs are charged to the user. ADFweb.com S.r.l. will not be liable for accidental loss of use or inability to use this product, such as loss of business income. ADFweb.com S.r.l. shall not be liable for consequences of improper use.

OTHER REGULATIONS AND STANDARDS

WEEE INFORMATION

Disposal of old electrical and electronic equipment (as in the European Union and other European countries with separate collection systems).
This symbol on the product or on its packaging indicates that this product may not be treated as household rubbish. Instead, it should be taken to an applicable collection point for the recycling of electrical and electronic equipment. If the product is disposed correctly, you will help prevent potential negative environmental factors and human health, which could otherwise be caused by inappropriate disposal. The recycling of materials will help to conserve natural resources. For more information about recycling this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

RESTRICTION OF HAZARDOUS SUBSTANCES DIRECTIVE

The device respects the 2002/95/EC Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (commonly referred to as Restriction of Hazardous Substances Directive or RoHS).

CE MARKING

The product conforms with the essential requirements of the applicable EC directives.

WARRANTIES AND TECHNICAL SUPPORT:

For fast and easy technical support for your ADFweb.com SRL products, consult our internet support at www.adfweb.com.
Otherwise contact us at the address support@adfweb.com

RETURN POLICY:

If while using your product you have any problem and you wish to exchange or repair it, please do the following:

1) Obtain a Product Return Number (PRN) from our internet support at www.adfweb.com. Together with the request, you need to provide detailed information about the problem.
2) Send the product to the address provided with the PRN, having prepaid the shipping costs (shipment costs billed to us will not be accepted).

If the product is within the warranty of twelve months, it will be repaired or exchanged and returned within three weeks. If the product is no longer under warranty, you will receive a repair estimate.

PRODUCTS AND RELATED DOCUMENTS:

Part	Description	URL
HD67648	Ethernet / Serial - Converter	www.adfweb.com?product=HD67648
HD67119	USB / RS485 - Converter	www.adfweb.com?product=HD67119
HD67507	Modbus TCP Slave /Modbus Master - Converter	www.adfweb.com?product=HD67507
HD67510	Modbus Slave /Modbus TCP Master - Converter	www.adfweb.com?product=HD67510